Stoller
Hanford Office

DOE-EM/GJ820-2005

299-W21-02 (C4639)
Log Data Report

Borehole Information:

Borehole:	299-W21-02 (C4639)		**Site:** East of U-12 Crib		
Coordinates (WA State Plane)		**GWL (ft)[1]:**	261.75	**GWL Date:**	12/09/04
North	**East**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
Not available	Not available	Dec. 2004	NA	381	Becker

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	0	6 1/4	6	0.12	0	380
Threaded steel	0	9	8	1/2	0	380
The logger measured the casing stick-up measured using a steel tape. The casing thicknesses for both the 6- and 8-in. casings are from a memorandum written by R. McCain dated July 9, 2003.						

Borehole Notes:

Zero reference is the ground surface. This borehole was logged through the drill pipe.

The Becker drilling system uses a dual-wall casing. Air flows down the annulus, and cuttings are returned inside the inner casing. Total wall thickness is 0.620 in., increasing to 1.115 in. at the casing joints, which occur at 10-ft intervals.

Logging Equipment Information:

Logging System:	Gamma 1E		**Type:** 70% HPGe (34TP40587A)
Calibration Date:	04/2003	**Calibration Reference:**	DOE-EM/GJ770-2004
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

Gross Gamma Logging System (GGLS) Log Run Information:

Log Run	**1**	**2**	**3**	**4 Repeat**	
Date	12/09/04	12/09/04	12/09/04	12/09/04	
Logging Engineer	Spatz	Spatz	Spatz	Spatz	
Start Depth (ft)	378.0	304.0	164.0	48.0	
Finish Depth (ft)	303.5	163.0	0.5	10.0	
Count Time (sec)	N/A[4]	N/A	N/A	N/A	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
Sample Interval	0.5 ft	0.5 ft	0.5 ft	0.5 ft	
MSA Interval (ft)	N/A	N/A	N/A	N/A	
ft/min	1.0	1.0	1.0	1.0	
Pre-Verification	AE035CAB	AE035CAB	AE035CAB	AE035CAB	
Start File	AE035000	AE035150	AE035433	AE035761	

Log Run	1	2	3	4 Repeat	
Finish File	AE035149	AE035432	AE035760	AE035837	
Post-Verification	AG035CAA	AG035CAA	AG035CAA	AG035CAA	
Depth Return Error (in.)	N/A	N/A	N/A	N/A	
Comments	No fine-gain adjustment.	No fine-gain adjustment. Level wind adjustment.	No fine-gain adjustment.	No fine-gain adjustment.	

Logging Operation Notes:

The borehole was logged through drill pipe. Gamma attenuation changes significantly as the sonde passes through the pipe joints and it is not possible to provide accurate casing correction factors. The log is run in continuous mode with a logging speed of 1 ft/min. and a count time equivalent to a depth increment of 0.5 ft. A total gamma log is produced for correlation purposes. Gamma energy spectra are available but counting statistics are relatively poor for most individual peaks.

Total gamma data were collected using Gamma 1E. Pre- and post-survey verification measurements employed the Amersham KUT (^{40}K, ^{238}U, and ^{232}Th) verifier with serial number 118. Logging was performed with a centralizer installed on the sonde. Zero reference was the ground surface. Maximum logging depth achieved was 378 ft.

Analysis Notes:

Analyst:	Henwood	Date:	12/26/04	Reference:	

Pre-run and post-run verification spectra were collected at the beginning and end of the day and compared to the acceptance criteria. All of the verification spectra were within the acceptance criteria.

Log spectra were processed in batch mode using APTEC SUPERVISOR to determine gross counts, and count rates were calculated in EXCEL. Zero reference was the ground surface. Water and dead time corrections were not applied to the data. The influence of the thick joints is apparent on the total gamma where reduced count rates are exhibited at approximately 10-ft depth intervals.

Log Plot Notes:

Log plots are provided for total gamma counts per second. Plots of the repeat log versus the original log are included.

Results and Interpretations:

A decrease in gamma activity occurs at each casing joint, where the increase in wall thickness results in greater attenuation of gamma activity. No anomalous gamma activity was observed. This observation suggests no significant concentrations of man-made radionuclides were encountered.

The plots of the repeat logs demonstrate reasonable repeatability of the total gamma log.

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[1] GWL – groundwater level
[2] TOC – top of casing
[3] N/A – not available
[4] n/a – not applicable

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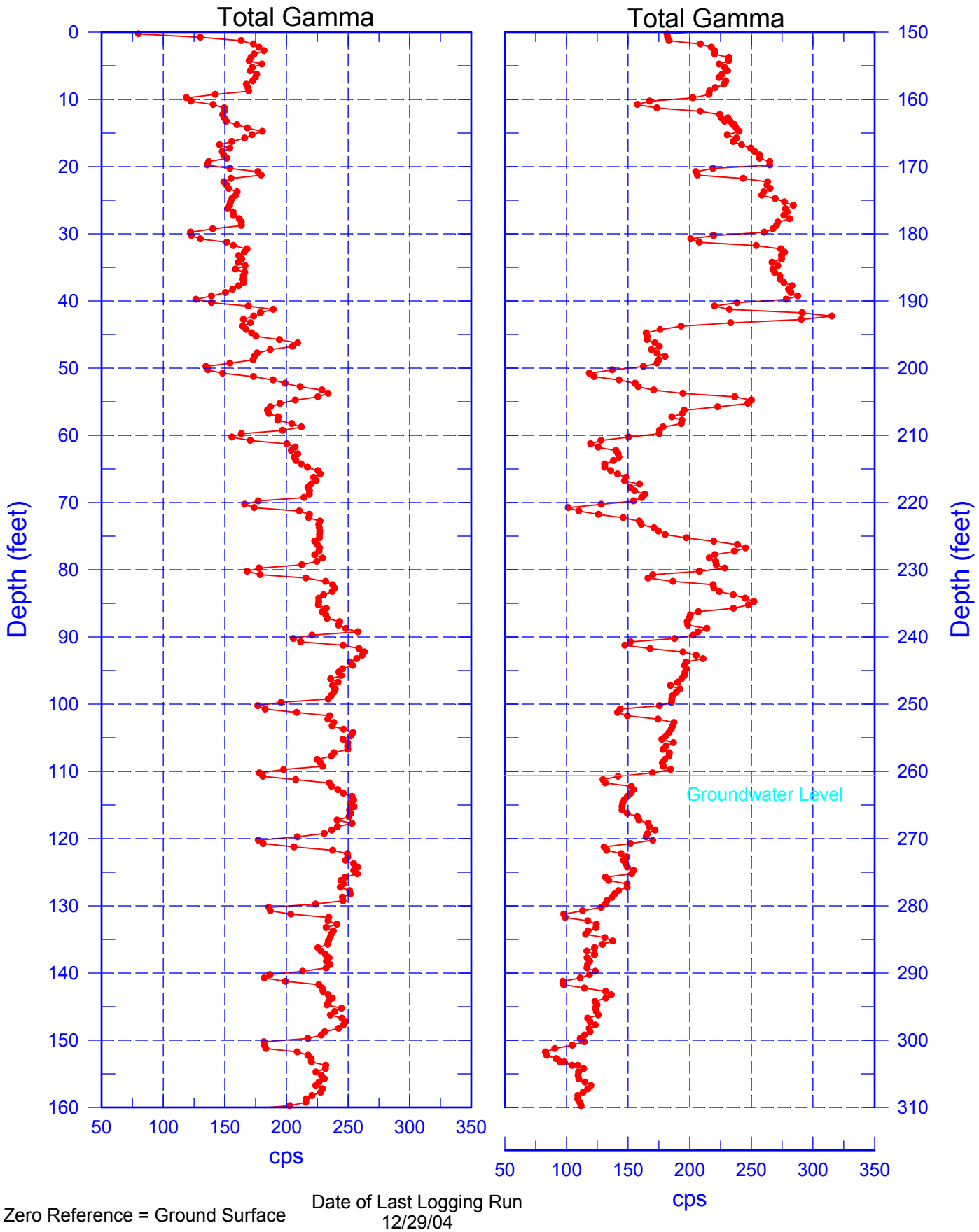

Zero Reference = Ground Surface

Date of Last Logging Run
12/29/04

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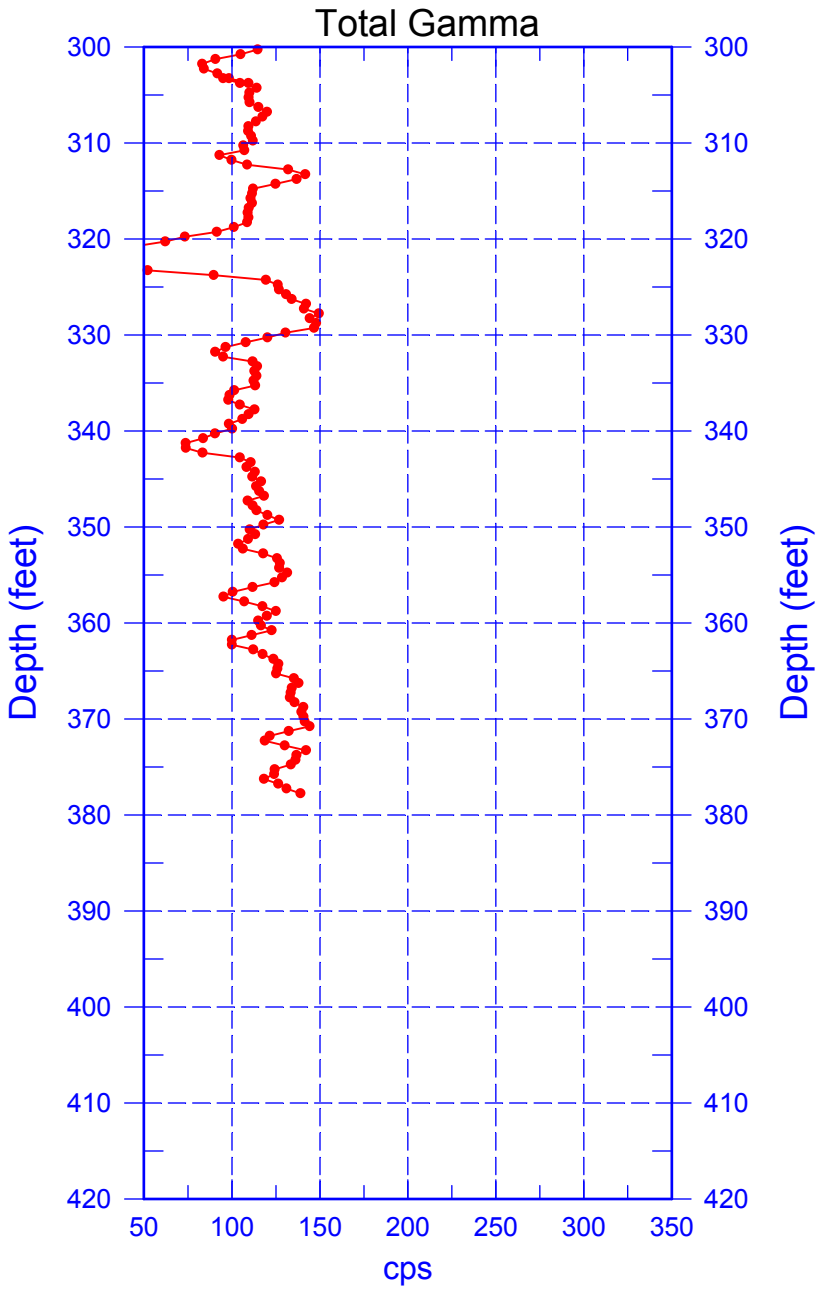

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Repeat of Total Gamma Log (10-48 ft)